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**⑤4 Spring plunger latch assembly.**

**(7)** An overhead mounted door holder assembly for attachment between a door jamb (14) and a door (12) for selectively holding the door in an open position includes a jamb bracket (16) attached to the door jamb (14), a double arm assembly (20) pivotally attached to the jamb bracket (16), the double arm assembly having a first arm (20) pivotally connected to a second arm (21), with the first arm (20) pivotally connected to the jamb bracket (16), and a channel assembly (22) having a channel (23) therein. A slide assembly (26) is positioned for movement in the channel (23) in response to opening or closing of the door, with the slide assembly (26) being pivotally attached to the second arm (21) of the double arm assembly (18). A spring plunger assembly (28) is supported by the double arm assembly (18), the spring plunger assembly (28) having a plunger housing (40) configured to retain a plunger (36) replaceably connected to a manually turnable plunger handle (30), and a lock plate (32) engageable by the plunger (36) to prevent pivoting movement of the first arm (20) with respect to the second arm (21), effectively holding the door in a user defined open position until a predetermined amount of force is applied to disengage the plunger (36) from the lock plate (32).

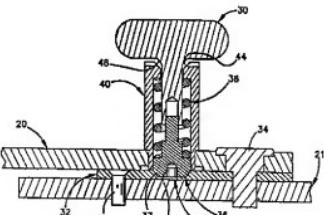


Fig. 3

This invention relates to an overhead door holder assembly and, more particularly, to an overhead mounted door holder assembly having two pivotably connected arms that are lockable to hold open a door.

Temporarily holding a door in an open position is often necessary for convenience and safety. One commonly employed method of holding open a door uses an overhead mounted door control device that includes a pivoting arm attached between an upper portion of a door jamb and an upper part of a door. When the door is to be held open at an angle that does not exceed about 110 degrees, an overhead mounted door control device is efficient, effective, and convenient to install and maintain, is less subject to damage by vandalism or accidents, and does not present a potential stumbling hazard.

However, many conventional overhead mounted door control devices are difficult or impossible to disable, with the door holding mechanism permanently active. Most conventional overhead mounted door holder assemblies cannot be selectively engaged, are not easy to install, and do not have wear elements that are adjustable or replaceable without significant effort and expertise.

The door holder should be set to permit easy engagement of the door holder, hold the door against minor amounts of jostling contact without release, and yet still permit closing the door without undue effort.

According to one aspect of the present invention, there is provided an overhead mounted adjustable door holder assembly for attachment between a door jamb and a door, for selectively holding the door in an open position, comprising a jamb bracket for attachment to the door jamb; a double arm assembly pivotally attached to the jamb bracket, the double arm assembly having a first arm pivotally connected to a second arm and pivotally connected to the jamb bracket; and a channel assembly having a channel therein with a slide assembly positioned for movement in the channel in response to opening or closing of the door, the slide assembly being pivotally attached to the second arm of the double arm assembly; characterised in that a spring plunger assembly is supported by the double arm assembly, the spring plunger assembly having a plunger housing configured to retain a plunger replaceably connected to a plunger handle, and a lock plate engageable by the plunger to prevent pivoting movement of the first arm with respect to second arm, effectively holding, in use, the door in a user defined open position until a predetermined amount of force is applied to disengage the plunger from the lock plate.

According to a second aspect of the present invention, there is provided an overhead mounted adjustable door holder assembly, for attachment between a door jamb and a door, comprising means for pivotally attaching a jamb arm to the door, the attaching means having first and second arms pivotally con-

nected to each other; characterised by means for holding the door comprising a spring plunger assembly, the spring plunger assembly having a plunger housing containing a plunger replaceably connected to a plunger handle, and a lock plate engageable by the plunger to prevent pivoting movement of the first arm with respect to the second arm, thereby effectively to hold the door in a user defined open position until a predetermined amount of force is applied to disengage the plunger from the lock plate.

The invention also extends to a door incorporating a door holder assembly essentially as just defined.

For a better understanding of the invention and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:-

Figure 1 is a perspective view of an overhead mounted door holder assembly that includes a spring plunger mechanism;

Figure 2 is an underneath view of the assembly, showing a handle used for operating the spring plunger mechanism;

Figure 3 is a cross sectional side view through a plunger housing and a lock plate; and  
Figure 4 is a view similar to Figure 3 but with the plunger retracted into the housing to disable the door hold feature.

As illustrated in Figures 1 and 2, an overhead mounted door holder assembly 10 has a channel assembly 22 positioned adjacent to the top of door 12. The channel assembly 22 is attached to the door 12 so that its longitudinally extending generally U-shaped channel 23 is upwardly open. Positioned for longitudinal sliding movement within the channel 23 is a slide assembly 26. The assembly 10 also includes a jamb bracket 16 fixed to a door jamb 14. A double arm assembly 18 extends between the jamb bracket 16 and the channel assembly 22 to connect the door 12 and door jamb 14. The double arm assembly 18 includes a first arm 20 and a second arm 21 connected to each other by a pivot 34, with the first arm also being pivotally connected to the jamb bracket 16 and the second arm being pivotally connected to the slide assembly 26. A stop 42 is attached to first arm 20 and extends downward to engage and prevent pivoting of the first arm 20 across the second arm 21. In preferred embodiments, the jamb bracket 16, double arm assembly 18 and channel assembly 22 are formed from brass or other durable, wear resistant material such as steel.

The door can be releasably held in an open position by engaging a spring plunger assembly 28 attached to the second arm 21 below a lock plate 32 affixed to the first arm 20. As seen in Figures 3 and 4, the spring plunger assembly 28 includes a plunger handle 30 threadably engaged with a plunger 36. The plunger 36 is formed from hardened steel to increase

its resistance to wear and is configured to have a bevelled edge 37 that enhances the ability of the plunger 36 to slide into and out of an aperture 33 defined in the lock plate 32. The plunger 36 and plunger handle 30 are partially contained by a plunger housing 40 which is cylindrically configured to accommodate a plunger spring 38 which simultaneously engages the plunger 36 and the plunger housing 40 to bias the plunger 36 outward from the housing 40 to engage the lock plate 32 when the door is fully opened.

The plunger 36 can be extended from the housing 40 to enable, or retract to disable, the door holding feature. The plunger handle 30 has a detent 48 that can be rotated with the plunger handle and once properly aligned can drop into a lock notch 44 that allows extension of the plunger 36 into its normal door hold open position. Continued rotation of the plunger handle through an angular distance of about 90 degrees pulls the plunger 36 up against the resistance of the spring 38, disabling the door hold feature, and allows the detent 48 to drop into a shallowly incised open notch 46. In this position, the plunger 36 will not engage the aperture 33 of the lock plate 32. Even when the hold open feature is enabled by rotation of the plunger handle detent 48 into position in the lock notch 44, the door 12 can still be forced from a hold open position by exertion of sufficient force so the bevelled edge 37 of the plunger contacts the edge of the lock plate aperture 33 and acts as a ramp to ease sliding retraction of the plunger 36 into the housing 40 against the biasing force of the spring 38.

With time, scraping contact of the bevelled edge 37 of the plunger 36 with the lock plate 32 wears away material of the plunger 36 and results in reduced engagement effectiveness and the need to replace the plunger 36. With the present construction, such replacement is easy and inexpensive. The door is rotated until the plunger 36 is exposed, and the plunger 36 is fixed in position by inserting a rod or other device into a plunger hold aperture. The plunger handle 30 is held and the plunger 36 is rotated to unscrew it from the plunger handle. The worn plunger 36 is discarded, and an inexpensive replacement is attached to the plunger handle 30.

## Claims

- An overhead mounted adjustable door holder assembly (10) for attachment between a door jamb (14) and a door (12), for selectively holding the door in an open position, comprising a jamb bracket (16) for attachment to the door jamb; a double arm assembly (18) pivotally attached to the jamb bracket, the double arm assembly having a first arm (20) pivotally connected to a second arm (21) and pivotally connected to the jamb bracket; and a channel assembly (22) having a

channel (23) therein with a slide assembly (26) positioned for movement in the channel in response to opening or closing of the door, the slide assembly being pivotally attached to the second arm of the double arm assembly; characterised in that a spring plunger assembly (28) is supported by the double arm assembly (18), the spring plunger assembly having a plunger housing (40) configured to retain a plunger (36) replaceably connected to a plunger handle (30), and a lock plate (32) engageable by the plunger to prevent pivoting movement of the first arm (20) with respect to second arm (21), effectively holding, in use, the door in a user defined open position until a predetermined amount of force is applied to disengage the plunger from the lock plate.

- An overhead mounted adjustable door holder assembly (10), for attachment between a door jamb (14) and a door (12), comprising means (16) for pivotally attaching a jamb arm (18) to the door, the attaching means having first and second arms (20, 21) pivotally connected to each other; characterised by means for holding the door comprising a spring plunger assembly (28), the spring plunger assembly having a plunger housing (40) containing a plunger (36) replaceably connected to a plunger handle (30), and a lock plate (32) engageable by the plunger to prevent pivoting movement of the first arm (20) with respect to the second arm (21), thereby effectively to hold the door (12) in a user defined open position until a predetermined amount of force is applied to disengage the plunger from the lock plate.
- An assembly according to claim 1 or 2, wherein the plunger housing (40) has a lock notch (44) and an open notch (46), the lock notch having a greater depth than the open notch, and wherein the plunger handle has a plunger handle detent (48) for engaging the lock notch and the open notch, respectively, as the plunger handle is rotated between locked and open positions.
- An assembly according to claim 1, 2 or 3, wherein the plunger housing contains a plunger spring (38) to bias the plunger toward the lock plate.
- An assembly according to any one of the preceding claims, wherein the plunger (36) is in threaded engagement with the plunger handle (30), thereby permitting replacement of the plunger when it wears and fails to engage the lock plate with required force to hold open the door.
- An assembly according to any one of the preceding claims, wherein the double arm assembly (18) further comprises a stop (42) attached to the first

arm and positioned to prevent movement of the first arm past the second arm.

7. An assembly according to any one of the preceding claims, wherein the plunger (36) is symmetrical about its axis to allow rotation in the plunger housing (40) and terminates in a bevelled edge (37) that permits ramped disengagement of the plunger from the lock plate (32).

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8. An assembly according to claim 7, wherein the plunger (36) further comprises means for holding during threaded engagement with the plunger handle (30), the holding means fixing the plunger in position as the plunger handle is threaded onto the plunger.

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9. A door incorporating a door holder assembly according to any one of the preceding claims.

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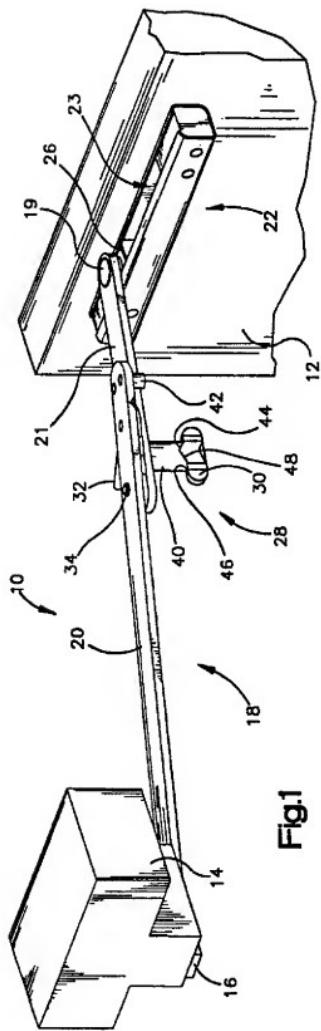


Fig.1

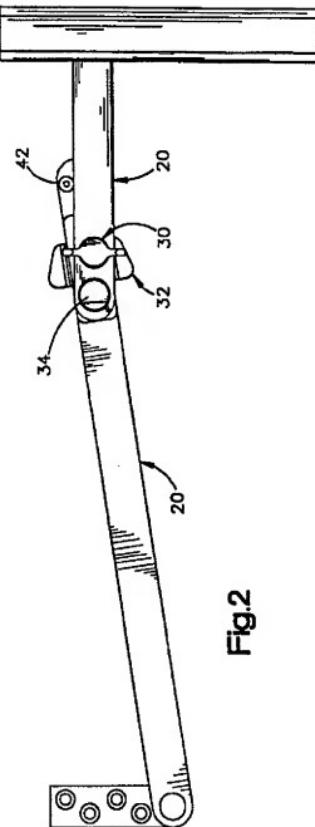


Fig.2

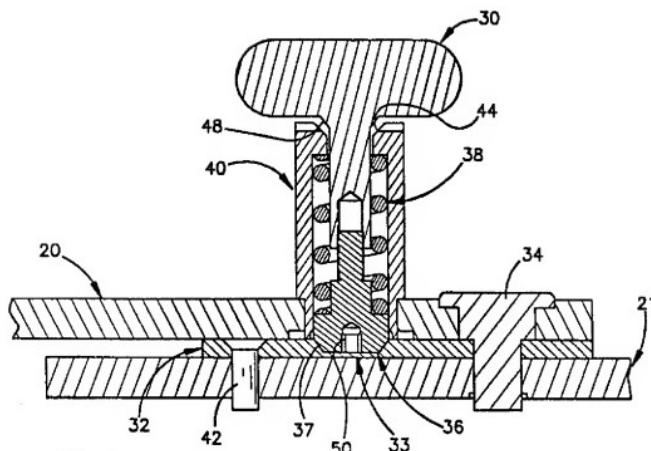


Fig.3

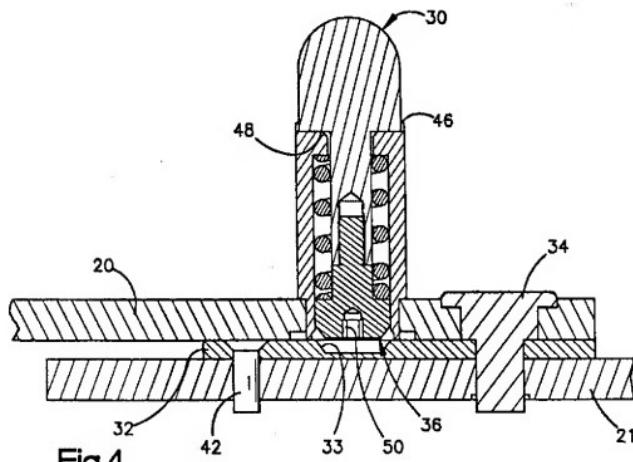


Fig.4



European Patent  
Office

## EUROPEAN SEARCH REPORT

Application Number  
EP 94 30 7554

DOCUMENTS CONSIDERED TO BE RELEVANT															
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.)												
X	US-A-3 259 936 (SHERIDAN) * the whole document * ---	1,2,4,6, 7,9	E05C17/32 E05C17/24												
X	US-A-3 877 108 (DEL FIACCO) * the whole document * ---	1-4,7,9													
X	US-A-1 966 205 (JOHNSON) * the whole document * ---	1-4,6,7, 9													
X	US-A-3 909 877 (CHRISTY ET AL.) * the whole document * ---	1-4,7,9													
A	GB-A-704 989 (CARBODIES LIMITED) * the whole document * ---	1,2,5,8, 9													
A	US-A-4 339 844 (SHATTERS) * the whole document * ---	1,2,5,8, 9													
A	GB-A-722 032 (PERSSON) * the whole document * ---	1,2,5,8, 9	E05C E05F												
A	DE-A-35 35 506 (OY WRATSILÄ AB) * the whole document * -----	1,2													
<p>The present search report has been drawn up for all claims</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Place of search</td> <td style="width: 33%;">Date of completion of the search</td> <td style="width: 34%;">Examiner</td> </tr> <tr> <td>THE HAGUE</td> <td>7 February 1995</td> <td>Vestin, K</td> </tr> </table>				Place of search	Date of completion of the search	Examiner	THE HAGUE	7 February 1995	Vestin, K						
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<b>CATEGORY OF CITED DOCUMENTS</b> <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">X : particularly relevant if taken alone</td> <td style="width: 33%;">T : theory or principle underlying the invention</td> </tr> <tr> <td>Y : particularly relevant if combined with another category</td> <td>E : earlier patent document, but published no, or later than the filing date</td> </tr> <tr> <td>Z : member of the same patent family</td> <td>D : document cited during the application</td> </tr> <tr> <td>A : technological background</td> <td>L : document cited for other reasons</td> </tr> <tr> <td>O : non-written disclosure</td> <td></td> </tr> <tr> <td>P : intermediate document</td> <td>R : member of the same patent family, corresponding document</td> </tr> </table>				X : particularly relevant if taken alone	T : theory or principle underlying the invention	Y : particularly relevant if combined with another category	E : earlier patent document, but published no, or later than the filing date	Z : member of the same patent family	D : document cited during the application	A : technological background	L : document cited for other reasons	O : non-written disclosure		P : intermediate document	R : member of the same patent family, corresponding document
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